

CLAIMS

What is claimed is:

1. An optical assay device for the detection of an analyte of interest,
comprising:
5 a base including absorbent material; and
a member including an optically active test stack, the member rotatably
coupled to the base for rotation between a lowered position where the optically
active test stack contacts the absorbent material for drawing a sample through the
stack and a raised position where the optically active test stack does not contact the
10 absorbent material.
2. The optical assay device of claim 1, wherein the member is rotatable
coupled to the base through a cam mechanism.
3. The optical assay device of claim 2, wherein the cam mechanism
includes at least one ramp, whereby the member moves up said at least one ramp
15 when the member is moved from the lowered position to the raised position, and
down said at least one ramp when the member is moved from the raised position to
the lowered position.
4. The optical assay device of claim 1, further including a retaining
mechanism adapted to retain the member to the base.

5. The optical assay device of claim 1, further including a stop mechanism adapted to restrain rotation of the member to the lowered position, the raised position, and therebetween.

6. The optical assay device of claim 1, wherein the member includes a projection adapted to be manipulated by the user's fingers to assist in rotating the member.

7. The optical assay device of claim 1, wherein the base includes a pair of finger grips to assist in holding the base.

8. The optical assay device of claim 1, wherein the optically active test stack includes an optically functional layer made of an amorphous silicon having a thickness between 1000 and 5000 Å.

9. The optical assay device of claim 1, further including a support that carries the optically active test stack, the support selected from a group consisting of Nylon, Track-etch Polyester, Nitrocellulose, and Polysulfone.

10. The optical assay device of claim 1, wherein the optically functional layer is coated with an antireflective layer having a thickness between 400 and 700 Å.

11. The optical assay device of claim 10, wherein the antireflective layer is coated with an attachment layer made of a diamond-like carbon having a thickness between 50 and 1000 Å.

12. An optical assay device for the detection of an analyte of interest in a sample, comprising:

a base including absorbent material;

5 a member including an optically active test stack, the member rotatably coupled to the base through a cam mechanism for rotation between a lowered position where the optically active test surface contact the absorbent material for drawing a sample through the stack and a raised position where the optically active test stack does not contact the absorbent material; and

a retaining mechanism adapted to retain the member to the base.

10 13. The optical assay device of claim 12, wherein the cam mechanism includes at least one ramp, whereby the member moves up said at least one ramp when the member is moved from the lowered position to the raised position, and down said at least one ramp when the member is moved from the raised position to the lowered position.

15 14. The optical assay device of claim 12, further including a stop mechanism adapted to restrain rotation of the member to the lowered position, the raised position, and therebetween.

20 15. The optical assay device of claim 12, where in the member includes a projection adapted to be manipulated by a user's fingers to assist in rotating the member.

16. The optical assay device of claim 12, where the base includes a pair of finger grips to assist in holding the base.

17. An optical assay device for the detection of an analyte of interest, comprising:

5 a base including absorbent material, the base lying generally in a first plane;

a member including an optically active test stack, the member lying generally in a second plan that is parallel to the first plane, the member operatively associated with the base for movement between a lowered position where the optically active test stack contacts the absorbent material and the member lies generally in the same plane as the base for drawing a sample through the stack and a raised position where the optically active test stack does not contact the absorbent material and the member does not lie in the same plane as the base.

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18. The optical assay device of claim 17, wherein the member is rotatably coupled to the base through a cam mechanism.

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19. The optical assay device of claim 18, wherein the cam mechanism includes at least one ramp, whereby the member moves up said at least one ramp when the member is moved from the lowered position to the raised position, and down said at least one ramp when the member is moved from the raised position to the lowered position.

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20. The optical assay device of claim 17, further including a retaining mechanism adapted to retain the member to the base.

21. The optical assay device of claim 17, further including a stop mechanism adapted to restrain rotation of the member to the first position, the
5 second position, and therebetween.

22. The optical assay device of claim 12, wherein the member includes a projection adapted to be manipulated by a user's fingers to assist in rotating the member.

23. The optical assay device of claim 1, wherein the base includes a pair
10 of finger grips to assist in holding the base.

24. An optical assay device for the detection of an analyte of interest, comprising:

a base including absorbent material;

a member including a central axis, the member including a central
15 aperture and an optically active test stack covering the aperture, the member rotatably coupled to the base through a cam mechanism for rotation about the axis between a lowered position where the optically active test stack contacts the absorbent material for drawing a sample through the stack and a raised position where the optically active test stack does not contact the absorbent material;

20 a stop mechanism adapted to restrain rotation of the member to the lowered position, the raised position, and therebetween; and

a retaining mechanism adapted to retain the member to the base.

25. The optical assay device of claim 24, wherein the cam mechanism includes a plurality of ramping members extending from the base, and a plurality of respective ramping members extending from the upper member that are adapted to
5 slidably cooperate with the ramping members upon rotation of the member for raising and lowering the generally circular member.

26. The optical assay device of claim 24, wherein the base includes a well that carries the absorbent material.

27. The optical assay device of claim 24, wherein the base includes a pair
10 of finger grips to assist in holding the base.

28. The optical assay device of claim 24, wherein the member includes a projection adapted to be manipulated by a user's fingers to assist in rotating the member.

29. An optical assay device for the detection of an analyte of interest,
15 comprising:

a base including absorbent material;

a member including an optically active test stack; and

means for raising and lowering the member between a lowered position where the optically active test stack contacts the absorbent material for
20 drawing an applied medium or the sample through the stack and a raised position where the optically active test stack does not contact the absorbent material.

30. The optical assay device of claim 29, further including means for retaining the member to the base.

31. A method for detecting the presence or amount an analyte of interest in a test sample, comprising:

- 5 providing an optical assay device, the optical assay device comprising a base including absorbent material, and a member including an optically active test stack, the member rotatably coupled to the base for rotation between a lowered position where the optically active test stack contacts the absorbent material and a raised position where the optically active test stack does not
10 contact the absorbent material;
- providing the member in the lowered position where the optically active test stack contacts the absorbent material for drawing an applied sample through the stack;
- applying the test sample to the optically active test stack;
- 15 applying a conjugate to the optically active test stack;
- applying a wash to the optically active test stack;
- rotating the member to the raised position where the optically active test stack does not contact the absorbent material;
- applying an amplifying reagent solution to the optically active test
20 stack;

rotating the member to the lowered position so that the amplifying reagent solution is drawn through the optically active test stack; and

observing the optically active test stack for a visual indication of the presence or amount of the analyte of interest.

5 32. A method for detecting the presence or amount an analyte of interest in a test sample, comprising:

providing an optical assay device, the optical assay device comprising a base including absorbent material, and a member including an optically active test stack, the member rotatably coupled to the base for rotation
10 between a lowered position where the optically active test stack contacts the absorbent material and a raised position where the optically active test stack does not contact the absorbent material;

providing the member in the raised position where the optically active test stack does not contact the absorbent material;

15 applying the test sample to the optically active test stack;

rotating the member to the lowered position where the optically active test stack contacts the absorbent material;

applying a wash to the optically active test stack;

rotating the member to the raised position where the optically active
20 test stack does not contact the absorbent material;

applying an amplifying reagent solution to the optically active test stack;

rotating the member to the lowered position where the optically active test stack contacts the absorbent material;

5 applying a wash to the optically active test stack; and

observing the optically active test stack for a visual indication of the presence or amount of the analyte of interest.

33. The method of claim 32, further including incubating the optically active test stack after applying the test sample and after applying the amplifying
10 reagent solution.